

Comprehensive Fisheries Survey of Upper Scott Flowage, Marinette County Wisconsin during 2001

Waterbody Identification Code 609400



Michael Donofrio
Fisheries Supervisor
Wisconsin Department of Natural Resources
Peshtigo
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EXECUTIVE SUMMARY

A comprehensive fisheries survey of Upper Scott Flowage on the Menominee River was conducted during the 2001 field season. The dominant gamefish species in the flowage were smallmouth (33 fish per mile), largemouth bass (population estimate = 0.2 fish per acre), northern pike (1.9 fish per acre), and walleye (26 fish per mile). Panfish were also abundant in this flowage: black crappie (population estimate = 1.9 fish per acre), bluegill (14 fish per acre), pumpkinseed (2.3 fish per acre), yellow perch (0.9 fish per acre), and rock bass (2.9 fish per acre). Bullhead species and white sucker are common fish species in this flowage. I recommend managing this flowage for smallmouth bass, northern pike, walleye and panfish.

Lake and location:

Upper Scott Flowage, Marinette County, T31N R23E Sec 32

Located in southeast Marinette County, it is an impoundment of the Menominee River and a boundary water with the State of Michigan.

Physical/ Chemical attributes (Carlson, Andrews, and Threinen 1975):

Morphometry: 539 acres, maximum depth 17 feet.

Lake type: Impoundment (1924).

Watershed: 4,048 square miles: including 58 acres of adjoining wetlands.

Basic water chemistry: hard water drainage with slightly acid. Light brown water of moderate transparency. Secchi disk reading of 8 feet, PH 6.9, Conductance 219 umhos.

Littoral substrate: 50 percent sand, 30 percent "muck", 10 percent gravel and lesser amounts of silt and rubble.

Aquatic vegetation: Submergent vegetation is present along areas of the shoreline, but river flows maintain a relatively clear stream channel. Eurasian milfoil hasn't been found in this flowage.

Other features: The reservoir has 6.2 miles of shoreline and 7.7 miles of additional island shoreline. The dam, creating this flowage, is regulated through a hydroelectric license issued by the Federal Energy Regulatory Commission to N. A. Hydro Corporation. The dam is a concrete gravity structure approximately 22 feet high and 538 feet long with a normal operating head of 16 feet. The dam is known by the name of Park Mill and is located 3 miles from the mouth of the river, although another hydroelectric dam is located approximately 1 mile downstream. The Park Mill Dam is one of ten dams located on the Menominee River and the 2nd to the last dam before Green Bay (see Appendix)

Purpose of the Surveys: Assess fishery status.

Dates of fieldwork: Electroshocking: May 8 and October 15, 2001

Fyke netting (all species) April 17-27 and June 14, 2001.

BACKGROUND

Upper Scott Flowage was created between 1920 and 1924 to generate power for the Menominee Paper Mill (currently owned by Kimberly Clark Corporation). The Upper Scott or Park Mill dam and hydroelectric facility is currently owned and operated by North American Hydro Corporation and is licensed by the Federal Energy Regulatory Commission. The current license expires in 2015. The power company owns a narrow riparian land zone within the flowage boundaries, but is located near the City of Marinette with several residences along the flowage. A boat landing on the Wisconsin side of the impoundment is maintained by Marinette County. The next dam is located 21 miles upstream and additional boat landings are located within that segment of the Menominee River. The operation of this facility does impact the fishery resource. The presence of the dam impedes upstream and downstream fish migration, impinges and entrains many fish through the turbine operation and otherwise alters the morphology of the river channel. Lake Sturgeon reside upstream and downstream of the dam and limited sturgeon harvest has occurred in this system.

Fish stocking of other species has not occurred within or upstream of this flowage. One previous fish survey of this flowage occurred in 1977. Some of the results from that survey are referenced in this report.

METHODS

Eight mini-fyke nets (1/4" stretch mesh with turtle exclusion) were lifted on June 14, 2001. Mini-fyke nets assess juvenile fish in the population. A WDNR standard direct current electrofishing boat was utilized on May 8 and October 15, 2001 along 1 mile of shoreline. Standard fyke nets (3/4" stretch mesh) were lifted daily from April 11-27, 2001. The number of fyke nets lifted by day was 9 nets on April 11, 8 nets on April 12, 13, 16-21, 23; 7 nets on April 14-15 and 24; and 4 nets on April 25-27.

Length to nearest tenth of an inch was recorded for all fish. In the mini-fyke surveys, the first 30 fish for each species was measured then a total count recorded. Some fish species were given a fin clip during the standard fyke net surveys for use in mark and recapture population estimates. Game fish were given T-bar, external tags to track movements and estimate the population size. Age structures (spines) were removed from smallmouth bass, per half inch group. Ages were determined according to standard WDNR procedures. Length at age comparisons are for all lakes sampled for those species in the northeast Wisconsin and were last updated in 2003.

RESULTS AND DISCUSSION

Catch per unit effort results are depicted in Table 1 and respective analysis for each major species is written below. No further analysis is presented for the following species: bullhead sp. sucker sp, common carp, bowfin, and redhorse sp. Although, a summary paragraph for these species is included at the end of this report.

Table 1. Catch per unit effort of gamefish and panfish species during comprehensive fish surveys in 2001 of Upper Scott Flowage, Marinette County Wisconsin. Netting catch rates are reported as average number of fish per net/day, while shocking catch rates are number of fish per mile of shoreline. Panfish data were not collected during all sampling events.

| Species | April 2001 fyke netting | May 2001 shocking | June 2001 mini- fyke netting | October 2001 shocking |
|-----------------|----------------------------|----------------------|---------------------------------|--------------------------|
| Smallmouth bass | 3.9 | 51.0 | 0.9 | 15.0 |
| Northern pike | 2.4 | 0 | 0.9 | 45.0 |
| Walleye | 0.3 | 11.0 | 0 | 41.0 |
| Largemouth bass | 0.3 | 1.0 | 0 | 0 |
| Black crappie | 2.5 | - | 1.5 | - |
| Bluegill | 14.7 | - | 17.5 | - |
| Pumpkinseed | 2.2 | - | 4.1 | - |
| Rock bass | 1.7 | - | 2.5 | - |
| Yellow perch | 1.0 | - | 0 | - |
| Yellow bullhead | 0.01 | - | 0 | - |
| Bullhead sp. | 1.5 | - | 0 | - |
| Lake sturgeon | 0 | - | 0 | - |
| White sucker | 0.5 | - | 0 | - |
| Bowfin | 1.1 | - | 0 | - |
| Muskellunge | 0.01 | - | 0 | - |
| Redhorse sp. | 4.4 | - | 0 | - |
| Sucker sp. | 0.5 | - | 0 | - |

Smallmouth Bass

During 2001 mini-fyke netting, smallmouth bass were captured at 0.9 fish per net/ day. Seven smallmouth bass, 14.7 to 17.4 inches, were caught during the juvenile fish sampling, but no juvenile smallmouth bass were observed during that effort.

Electroshocking produced an average of 33.0 fish per mile in 2001 compared with 3 fish per mile in 1977. Fyke nets lifted in April of 2001 produced 364 smallmouth bass (8 were recaptures) or 3.9 fish per net/ day. Very few T-bar tagged fish were caught in surveys or subsequently by sport fishermen. The 2001 adult smallmouth bass population is not estimated because of limited recaptures, but smallmouth bass were very abundant in 2001. Only 3 smallmouth bass were captured during a 1977 electroshocking survey and none in fyke net surveys.

The 13 and 17 inch size groups were the prominent lengths in the 2001 fyke net survey (Figure 1). Twelve smallmouth bass were larger than 19 inches. The length at age of smallmouth bass sampled in the spring of 2001 met or exceeded the northeast Wisconsin average for ages 3- 7, 9, 10 (Table 2).

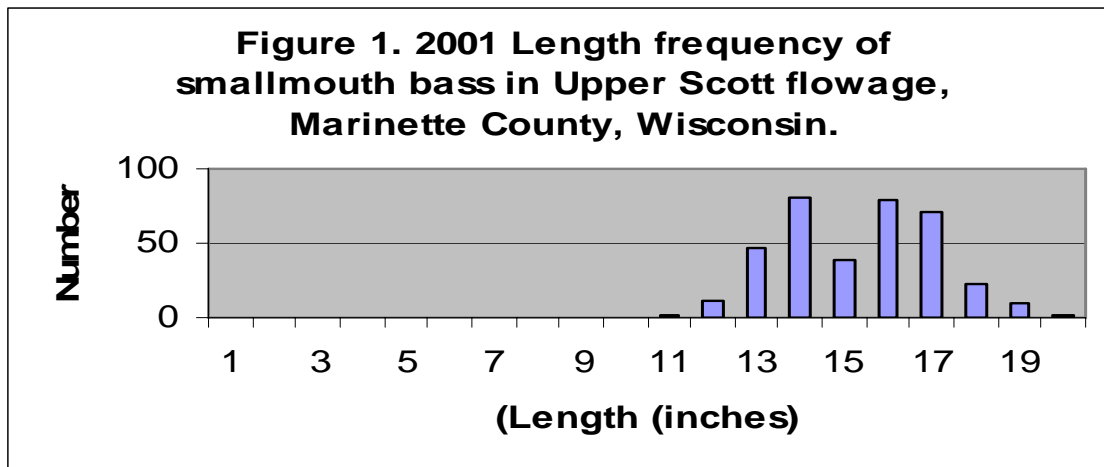


Table 2. Age- length distribution of smallmouth bass from Upper Scott Flowage, Marinette County Wisconsin in the spring of 2001 compared to Northeast (NER) Wisconsin average length at age. N equals sample size.

| Age | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|----------------------|------|------|------|------|------|------|------|------|
| NER Average (inches) | 9.9 | 12.3 | 14.2 | 15.8 | 17.1 | 18.5 | 18.6 | 19.9 |
| 2001 Upper Scott | 12.3 | 13.5 | 16.3 | 16.9 | 17.5 | 17.7 | 18.9 | 19.9 |
| 2001 (N) | 7 | 17 | 32 | 19 | 17 | 5 | 11 | 6 |

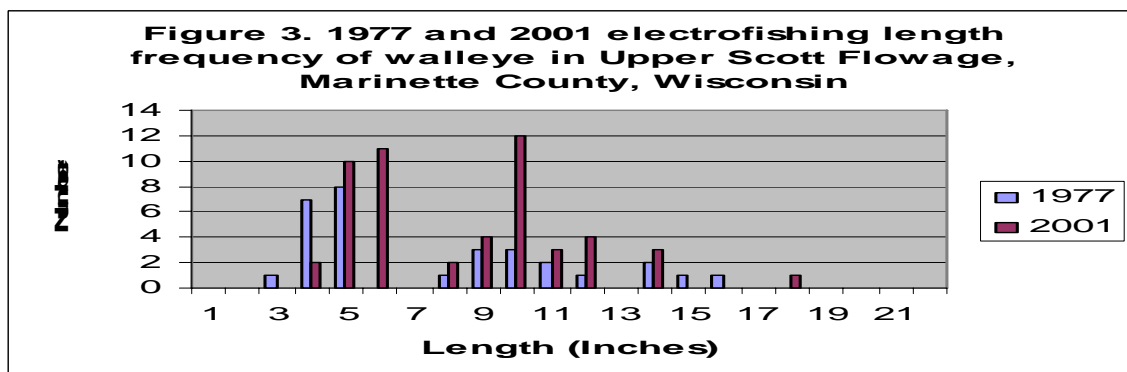
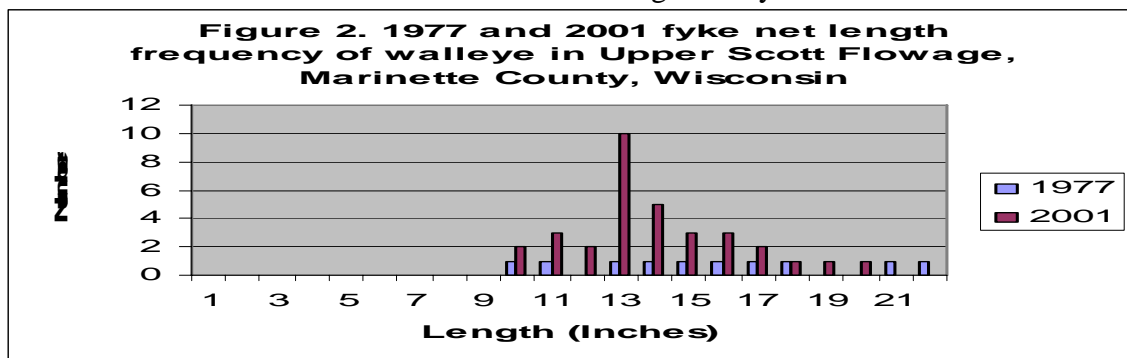
Largemouth Bass

Thirty- six largemouth bass were caught in spring fyke nets in 2001. The size range in that gear was 9.7 to 20.5 inches and the average was 14.2 inches. In fyke nets, 44% of the largemouth bass were greater than 14 inches. The population estimate based on spring fyke surveys in 2001 was 104 with a 95% confidence limit of 49 to 199. Largemouth bass weren't captured in mini-fyke nets in 2001. A spring of 2001 electrofishing survey yielded one 10 inch largemouth bass. In October of 2001, electrofishing survey resulted in the capture of 8 largemouth bass ranging from 10.8 to 17.5 inches. Several 1 to 3 inch largemouth bass were caught in 1977, but few adults were observed in that year.

Walleye

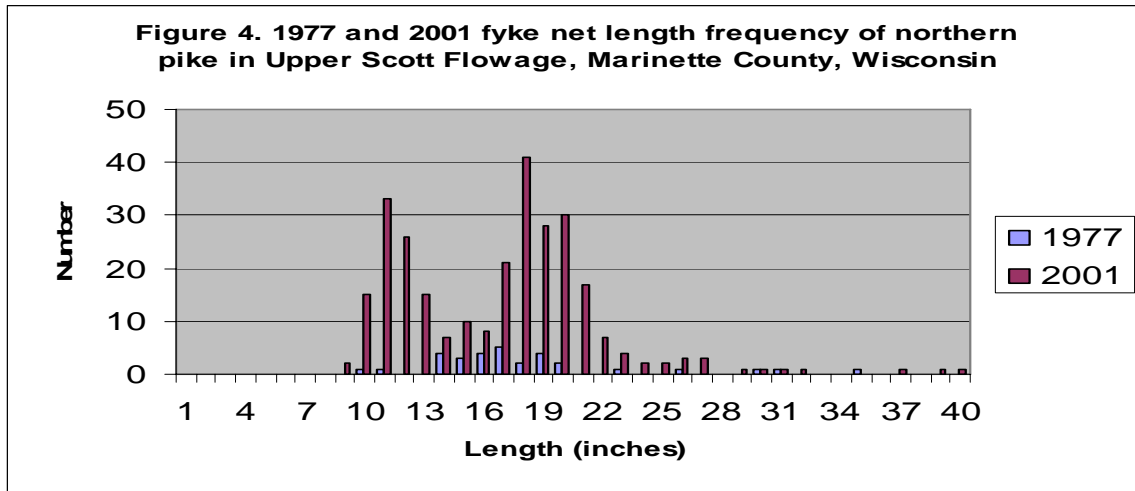
Fyke nets lifted in May of 1977 produced 0.34 fish per net per day, while the 2001 survey yielded nearly an equal catch per effort (0.3 fish per net per day). The 2001 fyke net survey yielded 33 walleye. Those fish ranged in size from 10.2 to 20.2 inches with an average length of 14.3 inches. A 1977 fyke net survey produced 10 walleye ranging from 10 to 22.4 inches. The size distribution for walleye in both surveys was similar although more fish were caught per inch group in 2001 (Figure 2). In 2001, most of the walleye were 10 to 17 inches in length.

Electroshocking produced 30 walleye per mile in 1977 compared to an average of 26 fish per mile in 2001 (Figure 3). Juvenile walleye were captured in 1977 and 2001 indicating good natural recruitment at Upper Scott Flowage. In general, limited numbers of adult walleye were caught in 1977 and 2001. A riverine environment would presumably cause walleye to migrate upstream, and away from this flowage, in the spring. The next dam, over 20 miles upstream, creates a difficult population to assess for a fish species that inhabits large portions of this riverine system. A walleye population estimate could not be calculated in 2001. No structures were retained to age walleye.



Northern Pike

Northern pike were more abundant in surveys during 2001 (327) compared to 1977 (42). Fyke nets lifted in May of 1977 produced 1.1 fish per net per day, while the April of 2001 survey yielded 2.4 fish per net per day. The size distribution for pike in fyke net surveys was similar although more fish caught per inch group in 2001 (Figure 4). In 1977, 77.4% of the pike were 14 to 20 inches in length, while 51.3% were captured in that size range in 2001 for all surveys. Electroshocking produced 11 northern pike per mile in 1977 compared to 22.5 fish per mile in 2001. Juvenile pike were captured in 1977 and 2001 indicating good natural recruitment at Upper Scott Flowage. A northern pike population estimate was calculated at 1,005 with the 95% confidence limit of 703 to 1,431 in 2001. No structures were retained to age northern pike.



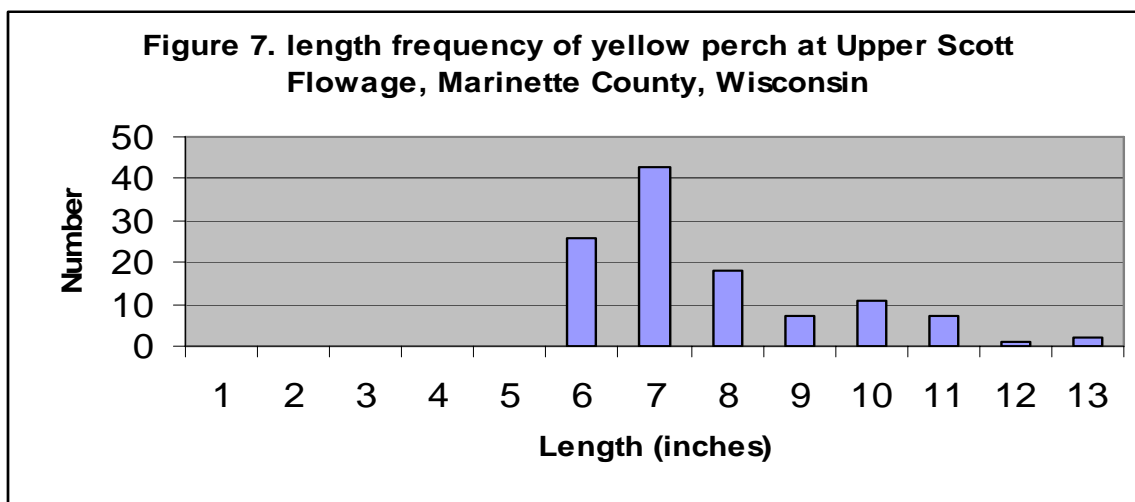
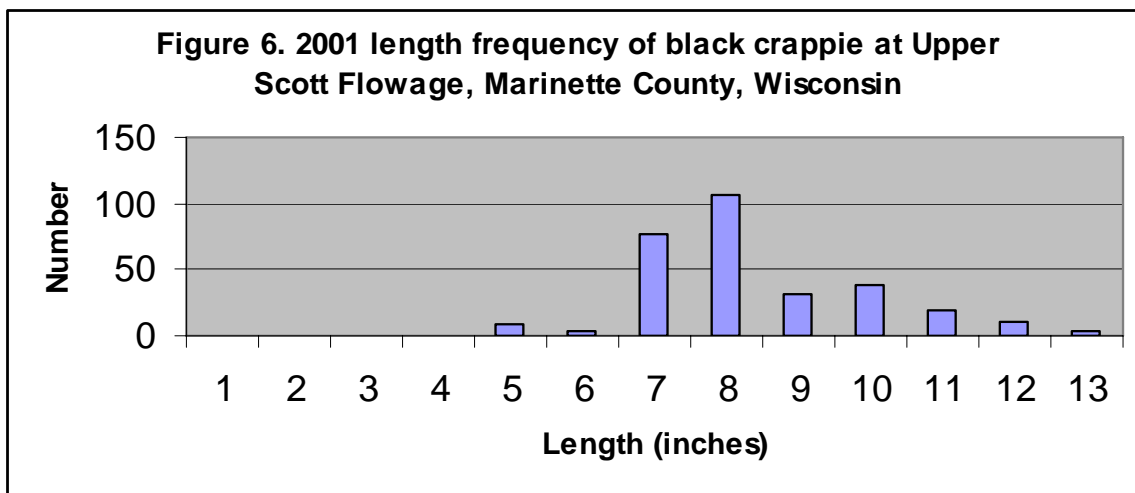
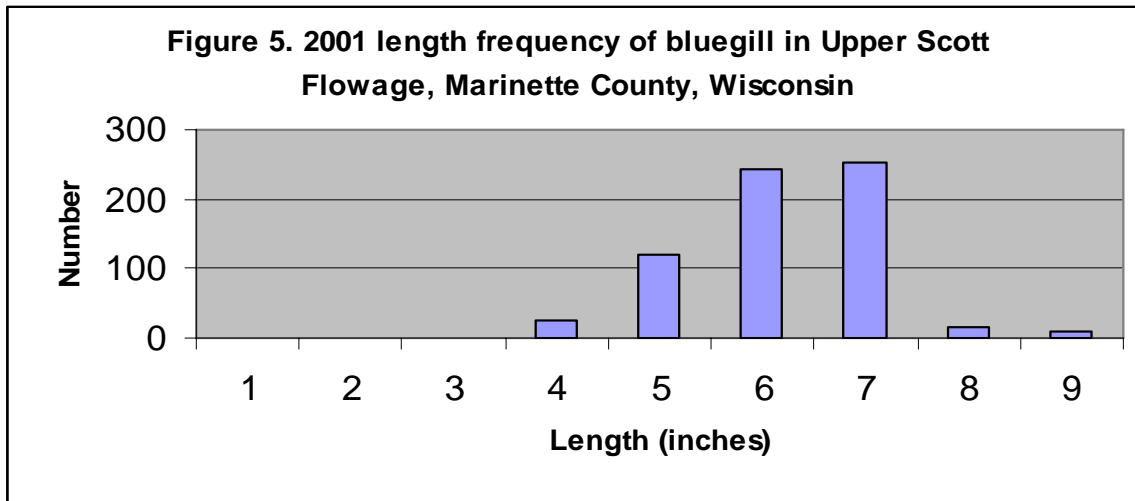
Panfish

Bluegill were the most abundant panfish caught in 2001 at 14.7 fish per net per day followed by pumpkinseed, rock bass, black crappie, and yellow perch. Panfish weren't noted in the 2001 electrofishing surveys. Abundant bluegill, black crappie, yellow perch, and pumpkinseed were also observed in the 1977 electrofishing survey. Mini-fyke nets from June of 2001 did not reveal young of year, less than 3 inches in length, for any panfish species.

The 2001 net survey revealed high numbers of bluegill from several inch groups (Figure 5). A population estimate for bluegill was 7,540 with a 95% confidence limit of 6,474-8,782. Bluegill ranged in size from 2 to 9 inches and 78% were greater than 6 inches compared to 75% in 1977.

In 2001, the black crappie 7-10 inch size groups were prominent in the survey (Figure 6). Several crappie were measured greater than 10 inches and 70% were larger than 8 inches compared to 79% in 1977. A population estimate for black crappie was 1,031 with a 95% confidence limit of 765- 1,387. In 2001, adult yellow perch were present in moderate numbers for all size groups (Figure 7). The size of yellow perch ranged from 6-13 inches and 40% were greater than 8 inches compared to 74% in 1977. A population estimate for yellow perch was 503 with a 95% confidence limit of 298- 833.

The size range for 234 pumpkinseed caught in 2001 was 3-7 inches compared to 4-7 inch size groups for 169 caught in 1977. A population estimate for pumpkinseed was 1,219 with a 95% confidence limit of 768- 1,912. The size range for 192 rock bass sampled in 2001 was comparable to 3-9 inch size groups for 54 fish caught in 1977. A population estimate for rock bass was 1,538 with a 95% confidence limit of 849- 2,687.



Other fish species

Other species caught during the 2001 surveys included redhorse sp., white sucker, carp, bowfin, and bullheads. These species were also present in 1977. Lake sturgeon and channel catfish are noted in this flowage, but weren't captured in our surveys.

CONCLUSIONS AND RECOMMENDATIONS

Upper Scott Flowage supports a very good fishery and natural reproduction of all species is present. The smallmouth bass population is exceptional as reflected by the large numbers caught and robust numbers of large adult fish. Northern pike are also an important species in this flowage and a very good size distribution was evident during surveys. The fishery surveys revealed limited numbers of walleye. Surveys also revealed a limited largemouth bass fishery in Upper Scott Flowage. The number and size of most species were more abundant in 2001 than 1977.

An extensive mark and recapture study was conducted at the Upper Scott flowage in 2001. Gamefish species were marked with T-Bar, external tags. 364 smallmouth bass were tagged, but very few recaptures made it impractical to estimate the population size although likely more than 3,000 smallmouth bass exist in this system. The northern pike population estimate (1,005) was more than four times larger than the Grand Rapids Flowage population estimate (246), upstream of Upper Scott. The largemouth bass estimate of 104 fish was lower than other game fish populations for this flowage. Panfish species were marked with fin clips and reliable population estimates were calculated for bluegill, black crappie, yellow perch, pumpkinseed, and rock bass.

The existing fishery is very good and no stocking is needed to enhance the populations of various species. The excellent smallmouth bass fishery is particularly targeted by fishermen. The present fishing regulations are maintaining a good quality fishery and no changes are needed at this time (Table 3). The previous fishery report for this flowage from 1978 noted concern about numerous articles written about the excellent fishery in this flowage, but the 2001 surveys conducted 23 years later imply that existing fishing pressure hasn't harmed the fishery.

Table 3. 2005 Upper Scott Flowage Fishing Regulations for selected species, Marinette County Wisconsin.

| Species/ Regulation | Smallmouth and largemouth bass | Walleye | Northern Pike | Panfish |
|------------------------|--|---|---|------------------|
| Daily limit | 3 rd Saturday in June through Nov 30 5 in total | March 2 to Friday preceding the 1 st Saturday in May = 1; 1 st Saturday in May to Mar 1 = 5 | 1 st Saturday in May to Mar 1 = 5 | 25 in total |
| Season | First Saturday in May to Friday preceding 3 rd Saturday in June Catch and release only | Open all year | Closed Mar 2 to Friday preceding the 1 st Saturday in May | Open all year |
| Size limit | 14 inches | 15 inches | None | None |

The hydroelectric company, North American Hydro, has operated this dam as run of river since 1987 (through 2015) and provides stable flows through the flowage. The issue of lake sturgeon stranding in the power canal in the Wisconsin side of the dam needs to be addressed as well as fish passage around this dam and the Lower Scott dam to allow for safe passage of Green Bay fish species. North American Hydro owns a limited shoreline zone. Residential development is noted along most of the flowage. Marinette County maintains a boat launch in the flowage and that facility is adequate.

ACKNOWLEDGEMENTS

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Cover image courtesy of TerraServer-USA website and United States Geological Survey.